Stormwater Flow

How has Water Quality Impairments caused by Stormwater been addressed in other areas?

The CWA requires all 303d impaired waters to establish the allowable pollutant loading from all contributing sources at a level necessary to attain the applicable water quality standards.

TMDL = WLA + LA + MOS

Can we design TMDLs to address Stormwater runoff?

- Many urban waters within Region 3 are listed as impaired for aquatic life

- Frequently the impairment is linked to stormwater runoff causing
  - Streambank Erosion
  - Scouring
  - Resuspension of sediment within the water
  - physical changes to the channel
  - Large loads of pollutants (sediment, toxics, etc) carried in stormwater runoff from the land
  - Destruction of habitat

All of these stressors are related to stormwater runoff

The Rivanna River Watershed

Sediment Unit	TMDL	Wasteload Allocation	Load Allocation	Margin of Safety (10%)
Lb/day	35,896	22,007	10,229	3,590

MS4 Permit Holder

Land-Based Loads (lbs/day)	477
Instream Erosion (lbs/day)	1,406
Existing Total Load (lbs/day)	1,883
Allocated Load (lbs/day)	776
Percent Reduction	59.3%

Implementation:

"The Commonwealth expects the permittee to specifically address the TMDL wasteload allocations for stormwater through the iterative implementation of programmatic Best Management Practices (BMP).

How can we address Stormwater?

EPA recognizes that designated uses and biocriteria can only be attained if non-chemical factors are addressed such as hydrology, channel morphology and habitat

Does EPA support and approve Stormwater TMDLS?

YES!

2 approved TMDLS in Connecticut
9 approved TMDLS in Maine
9 approved in Vermont
1 draft in North Carolina
1 draft Washington State
With many more in development

Potash Brook, VT

- Land Use Distribution: 54% developed, 30% agriculture, 17% forest or wetland

- Impaired for Aquatic Life Use

- TMDL was developed that addresses stormwater runoff volume as a surrogate for sediment and other pollutants associated with stormwater

Potash Brook, VT

- Instream hydrologic target based on reference watersheds
- Use of Flow Duration Curve to target high and low flows

TMDL = WLA + LA + MOS

-17.9 % reduction in stormwater runoff vol. =

-16.5% (WLA) + -1.4%(LA) + implicit MOS

Implementation

- Iterative, adaptive management approach to include a watershed permit that specifies the type and location of BMPs necessary to achieve the stormwater runoff reductions
- BMPS, not numeric effluent limitations
- First round of suite of BMPs including information gathering
- Monitoring
- Second round of BMPS and so on. . .

Eagleville Brook, CT

- Impaired for Aquatic Life Use
- Small urban area with college
- Pollutant: Combination of pollutants from developed areas and stormwater run off volume

Eagleville Brook, CT

- Impervious cover (IC) as a surrogate measure to represent stormwater flows and the pollutants delivered via the flows.

- 12% IC is the threshold observed for CT streams below which the streams are capable of meeting aquatic life use goals

TMDL = WLA + LA + MOS

- 12 % IC = 11 % (WLA + LA) + 1% (MOS)
- Established current IC conditions using ArcView Model
  - 3 water segments at 5%, 14% and 27%.
- Implementation: Reduction of *effective* IC. Iterative , adaptive management toward lessening stormwater impacts.
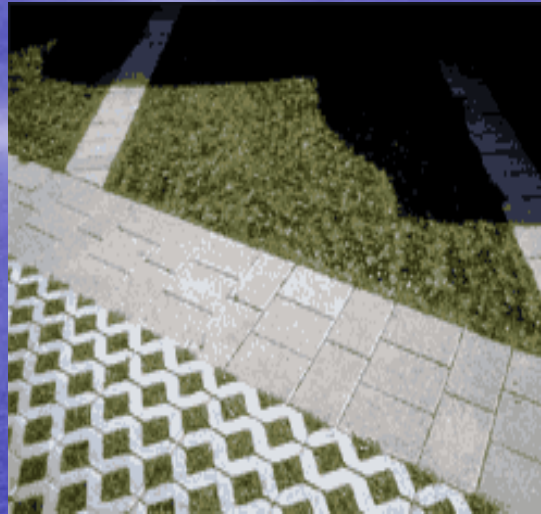
BMP Assessment and Application

Region 1 is using two tools to assess impacts of new development on watersheds or proposals to restore watersheds

- BMP Evaluation tool (evaluated single BMPs)

- Watershed BMP Decision Support System Model that evaluates BMPs applied throughout a watershed
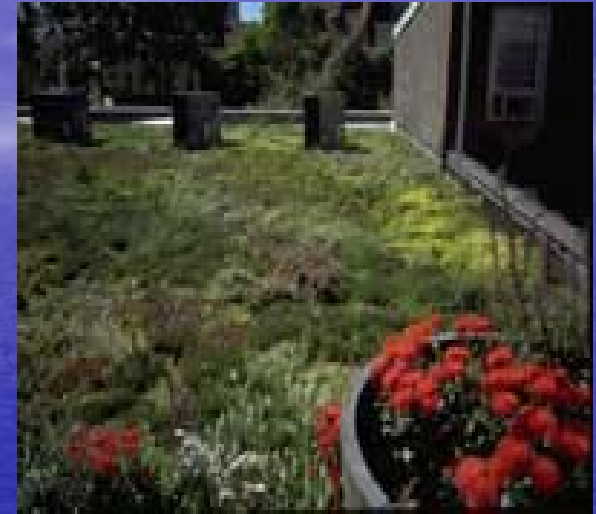
Types of BMPs

Bioretention area treating runoff from a parking lot

Pervious Pavement

vegetated roof cover. (Fencing Academy of Philadelphia Courtesy of EPA-841-B-00-005D)

International stormwater BMP database
http://www.bmpdatabase.org/
Urban BMP Tool
http://cfpub.epa.gov/npdes/stormwater/urbanbmp/bmpeffectiveness.cfm

Conclusion

- EPA supports the development of Stormwater TMDLs to address impairments caused by stormwater flow delivering an associated pollutant

- Implementation can be an iterative process through implementation of BMPS to meet water quality standards

- Opportunity to address stream impairment in urban watersheds that directly reduces the stormwater flow

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